

## REMARKS

Claims 1-17 are pending in the present Application. Claims 2, 8 and 17 have been canceled, Claims 1, 7 and 16 have been amended, leaving Claims 1, 3-7 and 9-16 for consideration upon entry of the present Amendment. A Request for Continued Examination under 37 C.F.R. § 1.114 also accompanies this amendment.

### Amendments to the Specification

The specification has been amended to better clarify the disclosure. Specifically, “comparison ratio” has been amended to “contrast ratio” to conform the specification to terminology more common in the art.

Also, in chemical formulas 7 and 8, “C” has been revised to “E” to avoid any confusion of this variable with carbon.

### Amendments to the Claims

Applicant acknowledges and thanks the Examiner for the comment that Claim 8 would be allowable if rewritten in independent form to include limitations from the base and intervening claims. Accordingly, Claim 7 has been amended to include limitations from claim 8, and Claim 8 cancelled.

Claim 1 has been amended to claim a liquid crystal composition comprised of three components, component “a)” described by chemical formula 1, component “b)” described by chemical formula 6, and component “c)” is at least one kind of liquid crystal selected from chemical formulas 7 and 8. Support for this amendment can be found at least on page 15, lines 7 to 17 of the specification as originally filed.

In addition, Claim 1 has been amended to correct an inadvertent typographical error in the definition to Chemical Formula 6.

Claim 16 has been amended to claim a liquid crystal composition comprised of component “a)” described by chemical formula 1 and component “b)” described of chemical formula 6. Support for this amendment can be found at least on page 15, lines 7 to 17 of the specification as originally filed.

No new matter has been introduced by these amendments. Reconsideration and

allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 112

Claim 1 stands rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to define the notation “D” in Chemical Formula 6 and including “B” in the definition where “B” is not part of the formula. This typographical error has been corrected by amendment. Accordingly the notation “D” in Chemical Formula 6 is now defined as “phenyl or cyclohexyl” (Claim 1, as amended). Accordingly, the claim should now be acceptable to the Examiner, and reconsideration and withdrawal of the rejection are respectfully requested.

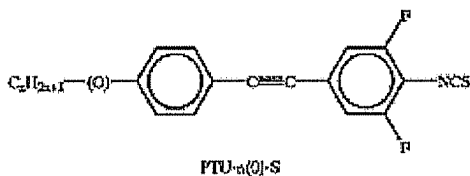
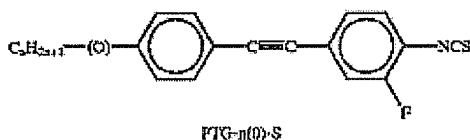
Claim Rejections Under 35 U.S.C. § 102(b)/(e) or 103(a)

Claim 17 stands rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,770,503 to Buchecker et al. (hereinafter “Buchecker”). In addition, Claim 17 stands rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent Application Publication No. 2002/0030180 to Tarumi et. al. (hereinafter, “Tarumi”).

Applicants have canceled Claim 17 without prejudice herewith upon entry of the present amendment, and hence the above rejections of Claim 17 are moot. Accordingly, Applicants respectfully request withdrawal of the rejection.

Claim 16 stands rejected under 35 U.S.C. § 102(b)/(e) as anticipated by European Patent Application EP 1126006 to Poetsch et al. (hereinafter “Poetsch”). Applicants respectfully traverse the rejection.

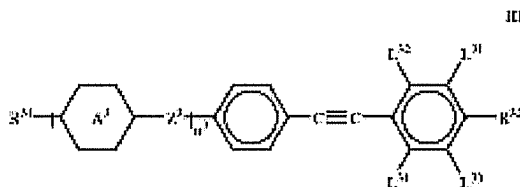
The Examiner states that the reference discloses the following compounds:



Poetsch teaches the chemical synthesis of a large number of compounds, that are applicable to liquid crystal media and liquid crystal displays. Poetsch teaches compounds of the general formula:



listing 231 alternatives for  $R^1$  and 16 “preferred” sub-formulae; including compounds with the general formula:

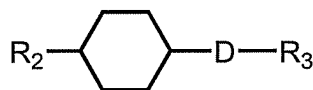


amongst other formula or sub-formulae. Poetsch provides two tables that present 63 core structures along with tables that provide “R” and “L” groups. The claims of Poetsch provide that  $R^1$  may be selected from 11 chemical groups along with numerous halogenated, non-halogenated, saturated and unsaturated options for the A and Z moieties.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987). Moreover, in order to anticipate a claim, a piece of prior art must clearly and unequivocally disclose the claimed composition or direct those skilled in the art to the composition without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference. *In re Arkley*, 59 CCPA 804, 455 F.2d 586, *Air Products & Chemicals, Inc. v. Chas. S. Tanner Co.* 219 USPQ 223, *Perricone v. Medicis Pharmaceutical Corp.*, 267 F.Supp.2d 229.

Claim 16, as amended, includes chemical formula 6:

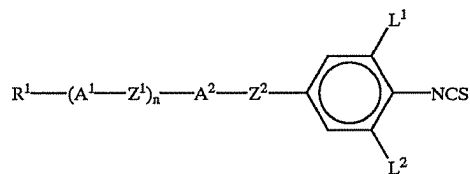
[Chemical Formula 6]



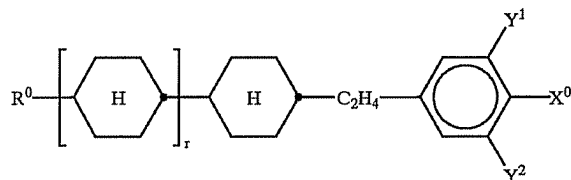
Poetsch does not teach or disclose this compound, or its combination with chemical formula 1, and therefore fails to teach or disclose all limitations of the claim. Because Poetsch does not teach all limitations, amended Claim 16 cannot be anticipated by Poetsch. Accordingly, Applicants respectfully request reconsideration and allowance of claim 16.

Claims 1, 3 and 6 stand rejected under 35 U.S.C. § 103(a) as unpatentable over United States Patent Application No. 2002/0030180 to Tarumi et al (hereinafter "Tarumi"). Claims 3 and 6 are dependent on Claim 1. Applicants respectfully traverse this rejection in view of the above-described amendments to Claim 1.

Tarumi describes nematic mixtures of compounds of with a general formula represented by the chemical formula:



including compounds with the formula:

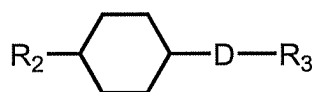


For an obviousness rejection to be proper, the Examiner is expected to meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the

prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, is expected to contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

Claim 1, as amended, claims a composition comprising a compound of chemical formula 1; a compound of chemical formula 6; and a compound of chemical formulas 7 or 8.

[Chemical Formula 6]



However, Tarumi does not disclose compounds described by chemical formula 6, or a combination of these with compounds of chemical formulas 1 and 7 or 8. Nor is there any suggestion in Tarumi that would motivate one skilled in the art to specifically include the compound of chemical formula 6 to provide the claimed composition.

In addition, Tarumi does not teach the molecules taught by the applicant for use in a nematic liquid crystal composition where Z<sup>2</sup> (as disclosed by Tarumi in Formula 1) can be -C≡C-, as is taught by the applicant.

Because Tarumi does not disclose or teach all elements of amended Claim 1, it cannot make Claim 1 unpatentable.

Claims 3 and 6 depend directly or from claim 1. Therefore, these claims which depend from claim 1 are allowable for at least the reasons given for claim 1 as amended. Accordingly, reconsideration and allowance of Claim 1 and its dependents is respectfully requested.

Claims 4-5, 7 and 9-15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Tarumi as applied to claims 1, 3 and 6 in view of U.S. Patent No. 6,573,964 to Takizawa et al. (hereinafter "Takizawa").

The Examiner states that it would have been obvious to those skilled in the art to apply the liquid crystal mixture of Tarumi into the device of Takizawa to arrive at the claimed invention. Tarumi, as discussed above, teaches liquid crystal compositions. Takizawa teaches a liquid crystal display device, including substrates, pixel electrodes, common electrodes, data bus lines, gate bus lines, etc., and a “liquid crystal composition containing liquid crystal molecules having negative dielectric anisotropy...”. (Col. 16, lines 45-67).

As noted above, Tarumi fails to disclose all elements of the nematic liquid crystal composition taught by the applicant in Claim 1, as amended. Claims 4, 5, and 7 each depend from Claim 1. Thus, as noted above, Tarumi does not anticipate the instant claims.

Takizawa further does not disclose all compounds taught by amended claim 1 (specifically, chemical formula 6), and thus Takizawa does not remedy the deficiencies of Tarumi. In fact, Takizawa fails to disclose any exemplary liquid crystal compounds, let alone the nematic liquid crystal compounds of the liquid crystal composition as claimed in amended instant Claim 1.

Further, no suggestion or motivation is present in Takizawa that would have led one skilled in the art to combine Takizawa with Tarumi to provide a nematic liquid crystal composition according to amended Claim 1 and its dependents. To perfect a prima facie case of obviousness, the references are expected to suggest their combination. See *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989) (“Although the Commissioner suggests that [the structure in the primary art reference] could readily be modified to form the [claimed] structure, ‘[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification’”) (citation omitted); *In re Stencel*, 828 F.2d 751, 755, 4 U.S.P.Q.2d 1071, 1073 (Fed. Cir. 1987) (obviousness cannot be established “by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion that the combination be made”). In fact, while Tarumi teaches a liquid crystal medium comprising polar compounds of positive dielectric anisotropy (Col. 18, Claim 1), Takizawa calls for a liquid crystal material containing liquid crystal molecules having negative dielectric anisotropy, thus teaching away from use of the compositions of Tarumi in the cell of Takizawa.

Indeed, while Takizawa extensively discloses the structure of a display device, it does

not disclose or teach the nematic liquid crystal compositions, and does not teach the advantageous use of nematic liquid crystal compounds that have the desirable properties of increased birefringence, or a broad nematic phase temperature, while preserving compatibility with additive compounds, such properties being claimed herein in Claim 5 of the present invention. Specification, p. 10, lines 1-11. There is no teaching or suggestion to combine elements of Tarumi and Takizawa to produce the present invention. Thus, Tarumi, in view of Takizawa, fails to disclose all elements of the instant claims, fails to teach or suggest the invention, and fails to provide a reasonable expectation that the desired features of the invention would be provided by a combination of the references. Thus, for at least these reasons, the instant claims are not unpatentable over Tarumi in view of Takizawa.

The Examiner notes instant claim 5 and reference mixture 1 of Tarumi, which has a phase transition of 105.5°C, stating one skilled in the art would expect a response time within the claimed range. Applicants respectfully disagree, and note that “[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, No. 04-1616 (CAFC March 22, 2006) citing *In re Lee*, 277 F.3d 1338, 1343-46 (Fed. Cir. 2002); and *In re Rouffett*, 149 F.3d 1350, 1355-59 (Fed. Cir. 1998). Additionally, “[a]lthough the suggestion to combine references may flow from the nature of the problem, ‘[d]efining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness.’” (internal citation omitted) *Id.*, quoting *Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 881 (Fed. Cir. 1998); *In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992). To find obviousness, the Examiner is expected to “identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *KSR v. Teleflex*, 2007 WL 1237837, at \*14.

The mixture cited by the Examiner, reference mixture 1 of Tarumi, differs from those taught by the Applicant. As noted by the Examiner, the reference does not teach response time. Further, as illustrated by the applicant’s comparative examples, response time is not a variable one skilled in the art can predict based on teachings of the cited art. As a result, one skilled in the art would not have an expectation of success as defined by Claim 5 (a liquid

crystal cell with phase transition of at least 85°C and a response speed of 9 to 11 ms), based on the teachings of the cited art.

Finally, as noted above, because Tarumi in view of Takizawa does not teach all elements of Claim 1 (as amended), it cannot make unpatentable the claim and thus fails to make Claim 1, as amended, unpatentable. Furthermore, the Examiner has indicated that Claim 8 contains allowable subject matter, and Claim 7 has been amended to include the allowable subject matter of Claim 8. Claim 7 should therefore be allowable as amended. Claims 9-15 each depend from Claim 7, and therefore should be at least allowable as depending from an allowed claim.

Accordingly, reconsideration and allowance of claims 4-5, 7 and 9-15 is respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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Date: August 16, 2007